

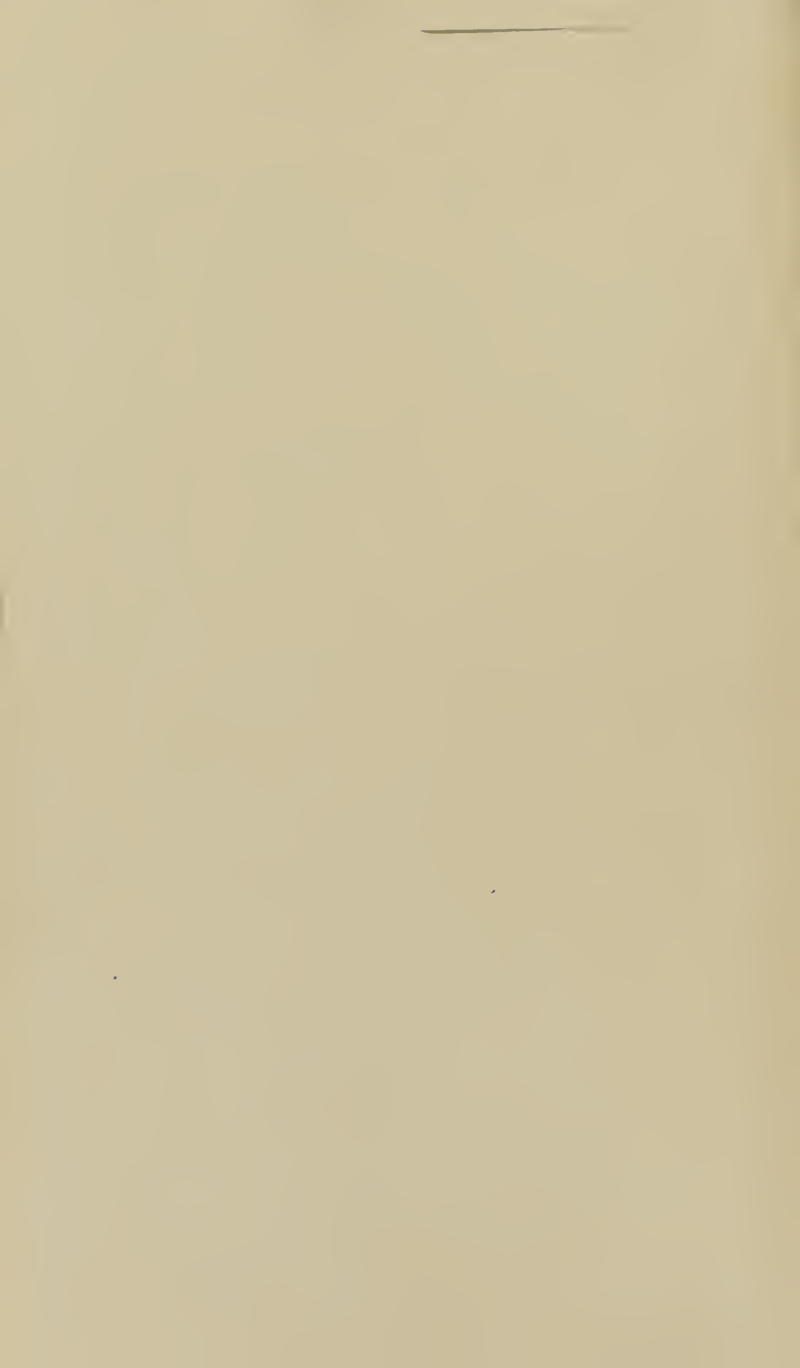
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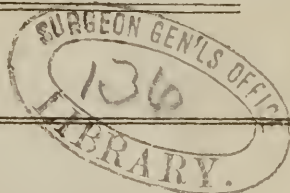
A N
INAUGURAL ESSAY
ON
EPILEPSY,
SUBMITTED TO THE EXAMINATION OF THE
REV. JOHN EWING, S. T. P. Provost;
THE
TRUSTEES AND MEDICAL FACULTY
OF THE
UNIVERSITY OF PENNSYLVANIA,

On the 17th day of May, 1796.

FOR THE DEGREE OF DOCTOR OF MEDICINE.

By John C. Otto. A. M.

Member of the Medical and Chemical Societies of Philadelphia.



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with the compliments
of the Author



TO

Benjamin Rush, M. D.

PROFESSOR OF THE INSTITUTES AND OF
CLINICAL MEDICINE,

IN THE

UNIVERSITY OF PENNSYLVANIA;

T H I S D I S S E R T A T I O N

IS INSCRIBED,

AS A TRIBUTE OF GRATITUDE AND ESTEEM,

BY HIS SINCERE FRIEND AND AFFECTIONATE PUPIL,

JOHN C. OTTO.



Epilepsy.

THE subject of the present Dissertation has received different names. It has been called *morbis comitialis*, from its occurring in crowded assemblies; *morbis herculeus*, from the difficulty of cure, or perhaps from the strength displayed by the miserable patient in a paroxysm of this disease. The *falling sickness*, however, is a name more frequently given it. This, perhaps, is as applicable as any, for the diseased falls down upon an attack of it. Even superstition has not been idle upon this subject. It has assumed the name of *morbis sacer*, from the supposition that the gods punished men with this disease, as a peculiar mark of their displeasure. And a person, in perfect health, falling down and appearing in the most violent agony, without any apparent cause, was a sufficient reason to induce the ignorant to ascribe it to some supernatural agent.—We shall consider it under the most familiar name of *Epilepsy*.

Dr. Cullen defines it to consist “ in convulsions of the greater part of the muscles of voluntary motion, attended with a loss of sense and ending in a state of insensibility and seeming sleep.” This comprehends the prominent features of the disease, and is sufficient to distinguish it from *palsy*, *apoplexy*, *catalepsy*, *tetanus*, and other complaints.

A F I T.

AS the circumstances attending it are nearly the same in all persons, except with regard to violence, it will be unnecessary to be prolix. The person attacked falls down suddenly with a perfect loss of sense in violent cases ; but in the mild, there is sometimes a recollection of whatever has passed during the paroxysm. The jugulars swell and the vessels of the head appear turgid ; there is a violent contraction and alternate relaxation of the muscles of the body or part of it : those of the face are particularly liable to be affected, and exhibit violent distortions. A frothing of the mouth attends ; and the eyes are frequently turgid and turned upwards. The respiration and pulse are hurried and irregular ; the latter seldom shewing any preternatural force or softness. The paroxysms continue generally but a short time, and then terminate in dulness and stupidity, which continue in duration most commonly in proportion to the violence of the preceding attack. After this, the patient fre-

quently enjoys good health until he is again attacked in the manner already described.

REMOTE CAUSES.

THESE are whatever have a tendency to produce debility in the animal economy in general, and particularly in the nervous system. This is of two kinds, direct and indirect. The first consists in an unusual abstraction of the stimuli that support life; and the latter in the excessive application of them. Under the first head may be ranked fear—the abstraction of the stimulating passions—excess in venery—depletion to a considerable degree—some poisons—odours, &c. under the latter, all the stimulating passions—frequent intoxication—the application of particular medicines, as stramonium—intense study or continued application of the mind to any particular subject. These causes have been known to give a disposition to this disease, and their action, it is evident, is principally on the brain and nervous system.

PREDISPOSING CAUSE.

THIS, like all other diseases of the nervous system, depends upon a debility or mobility of the nerves. This I infer,

1st, From those most subject to this disease; and,

2dly, From the time it most frequently attacks.

The slightest retrospect will convince us of the truth of this cause. It is the delicate female, and tender infant, that most frequently suffer: they, whose minds are subject to a constant change, and upon whom every impression excites to considerable action, are the most frequent victims. Delicate civilized life has become familiar to it, while rude and savage nations scarcely know the pang of a convulsion.

The brain in children is larger and less firm than in advanced years: its softness causes it to be thrown more easily into irregular action upon the application of any thing of an irritating nature. Plethora disposes to an attack of this disease; and the quantity of blood sent to the brain, in childhood, in proportion to the body, is much greater than in any subsequent period of life. It needs no other proof that these are the real causes, than this single reflection that maturity alone has sometimes restored to health. A paroxysm of anger has no influence upon the firm nerves of a nurse, while it will convulse a delicate infant at her breast.

2dly, This disease frequently makes its attacks at night, or early in the morning; a season when

the animal economy is the most debilitated. The excitement or strength of the body is diminished, while the aptitude to receive impressions is increased. From these circumstances, we must conclude that debility in the whole system, and particularly in the nervous, disposes to Epilepsy—I say particularly in the nervous; for if it resides in the arterial, a fever, and not convulsions, is the effect of an application of an occasional cause. Hence we observe, those who are subject to convulsions, are seldom afflicted with an inflammatory fever, and *vice versa*.

Nervous diseases are the offspring of cultivated society; the modes of life and manners attendant upon such a state, give a quickness of perception and delicacy of feeling. The scenes of a tragedy are too feeble to produce considerable emotion in a savage bosom; while the civilized and refined fair one, sometimes faints, and is occasionally convulsed. Her feelings are so easily excited, and her imagination so soon wrought upon that the different objects of distress, are frequently presented to her view, even in dreams, while the savage slumbers undisturbed. The higher this refinement is carried, the more frequently will these unnatural diseases appear. Even our own country can bear testimony of this, by the revolution of them that is constantly taking place.

Happily for mankind, a predisposition to Epilepsy may exist through life, without the disease actually appearing. The debility occasioned by cold disposes to inflammatory fever; but a disease does not occur without the application of some disproportioned stimulus. Parallels to this are to be found in every medical author.—A predisposition to Epilepsy is sometimes derived from ancestors: the disease is not inherited, but a mere aptitude to be affected upon the application of some occasional cause. This is not peculiar to Epilepsy, for Gout and Consumption exhibit instances familiar even to the vulgar. The descendants of persons labouring under these diseases, frequently avoid them by abstinence and care. It will not appear strange, that a predisposition to certain disorders is derived from ancestors, when we reflect that disposition, faculties of the mind, features, and even form itself, is transmitted. Thus a similitude appears between parents and children in the structure and organization of every part of the system. Van Swieten * says, that the disposition sometimes passes one generation and appears in the next: the son, by an active and sober life, subdues it; but communicates an aptitude to his offspring. Dr. Blackmore has observed the same thing to take place in the gout; and has happily compared it to a river

* Vol. X. p. 315.

in Africa, that runs through a great extent of country, and then disappears, but emerges again from the earth at a distance from whence it descended. The same has been observed of Scrophula, and other diseases.

EXCITING CAUSES.

THESE may be ranked under two general heads :

- 1st, Those that produce violent excitement ; and,
- 2dly, Those that produce debility.

The first may be subdivided into 1st, Those causes that act primarily upon the brain ; and, 2dly, Those that act primarily upon the system at large, and, through its medium, influence the nervous system.

Under the first head of the subdivision are included splinters of the *cranium*—the ends of sharp instruments penetrating it—ossification of the membranes, &c. Dissections have shewn that all these have induced the Epilepsy.

The passions prove powerful exciting causes of this disease. Cæsar was subject to it, especially on

the eve of a battle.* Joy and anger have each produced it. The first seems to act principally upon the nervous system; the latter has considerable influence upon the arterial. They act as violent stimuli, prostrating in an instant, the nervous system. The death of the Roman mother at the sight of her son, returned from the battle of Cannæ, was occasioned by the violent impression of joy—it must have acted like a powerful shock of electricity, producing, perhaps, a destruction of excitability.

Anger seems to derive some of the violence of its action from the instrumentality of the blood; for the face is flushed, the vessels of the head turgid, and every evidence exists of an increased determination to the brain—Joy and anger produce indirect debility in the nervous system in the same manner that some contagions and other stimuli prostrate the arterial. Perhaps the effects of certain odors may be explained in a similar manner.

The sight of persons afflicted with this disease, has produced a like affection in the bye-standers. This circumstance has taken place so frequently as to make it impossible to deny it: the most remarkable instance of this kind occurred at the poor-house in

* Zimmerman's Experience, Vol. II. p. 333.

Hærlæm ; where nearly all the children were affected by seeing a person attacked with it.

The method of accounting for it satisfactorily, requires a more extensive knowledge of the laws of the human frame than I possess. Man is said to be an imitative animal ; and to this sense of imitation many have ascribed this phenomenon. The horror, induced at the sight of a person labouring under this disease, has likewise been called in to explain it. Similar facts present themselves every where ; and Whyte, in his elaborate treatise upon the nerves, has mentioned many. He accounts for it by supposing that, “ in these cases, the impression made upon the mind, or *sensorium commune*, by seeing others in a disordered state, raises, by means of the nerves, such motions or changes in certain parts of the body, as to produce similar affections in them ; and hence it is, that the sight only of a person vomiting has often excited the same action in others.” And so great is the susceptibility to action in some persons, that the slightest impression will induce a disposition to imitation.

Over-distention of the blood-vessels of the brain proves a frequent exciting cause : this is evidenced by a turgescence of them, and a dimness of sight taking place previous to a paroxysm. The precursors, as shall be shewn hereafter, corroborate it ; for they

discover increased excitement in the brain. Those effusions that appear upon dissection put the question beyond the shadow of doubt. The apparent fullness that occurs in the vessels previous to a fit, induces the opinion that the effusions are the effect, and not the cause. But Epilepsy frequently succeeds those diseases that are universally confessed to arise from too great a determination to the brain, such as *mania* and *apoplexy*. That over-distention of the vessels of the brain, is a fruitful cause of Epilepsy, is evidenced, by the manner of operation of several of the exciting causes. Heat applied to the head—anger—severe exercise—a surfeit, or fit of intoxication, have all a tendency to this effect.

Debility was considered as the pre-disposing cause of Epilepsy ; now plethora often accompanies, and is a mark of debility. This over-proportion of blood that constitutes plethora, renders the vessels of the brain, very liable to be over-distended, by the application of any substance or means that increases the circulation.

But there are other exciting causes that seem to act primarily upon the body. In fact, the application of heat, exercise, and intoxication, already mentioned, produce over-distention of the vessels of the brain by the influence they have upon the circu-

lation. Convulsions sometimes occur in inflammatory fevers, from the stimulus of the blood upon increased excitability, or from contagion, and are only to be cured by the liberal use of the lancet. I saw a case in which the convulsions, and its precursors tremors, were gradually diminished by four bleedings.

The most fruitful and least dangerous occasional causes, in children, are stimuli acting upon particular parts, and thence communicated to the whole nervous system. These are worms, teething, the irritation that attends the eruption of certain contagious diseases. To these may be added, the stimulus of a calculus in the kidney, or any local applications; cantharides have proved sufficiently violent to produce this effect, and even the acrimony of the furies of old fores has had a similar operation. Poisons—great pains—the cessation or stoppage of humors that used to be evacuated, as the drying up of old fores—the retention of the menses, and the ceasing of the bleeding in piles, have all had the same effect.

Among the exciting causes, that must not be omitted that is accompanied with the *aura epileptica*. This is a sensation of something, arising from the body or extremities and extending upwards, like a blast of wind, or stream of cold water; and, when it reaches the brain, a paroxysm immediately ensues. The circumstance of

the sensation going, from a particular part, directly to the brain, would induce the supposition, that it originated from an irritation of a nerve ; but nice observation upon this point discovers, that the sensation is not continued along the course of any nerve. Some instances, however, have been mentioned by authors, where the *aura epileptica* arose from a visible irritation of a part.

A fruitful exciting cause is still to be mentioned ; viz. whatever makes a strong impression upon the nervous system, occasioning great pleasure or pain. Unless the force of impression is considerable, no remarkable change occurs, except the predisposing cause exists to a considerable degree. The impressions that induce pleasure, seem to be conveyed directly to the brain, by the nerves ; while those that induce pain, frequently act primarily upon the muscular fibres, producing distention and inflammation. The causes of both being the same, only varied in order and degree. They all seem to act by creating an excessive excitement in the brain in particular, or in the whole system in combination with it. There is no necessity for the predisposition to exist, to a considerable degree, in every case ; for the violence of the occasional cause is sometimes sufficient of itself to bring on the disease. And, when induced, it is the same, by whatever cause effected. Like the pleurisy, it may

be excited by intoxication, the heat of the fire, &c.; but remains unaltered by whatever occasions it.

That violent stimuli should produce irregular and excessive action in a part, is no new law of the animal economy. We see it illustrated every where, in the familiar diseases of the arterial system. We might as well expect to see a vessel ride safely and equably in a gale of wind, as to expect the excitement of the system to be regular, upon the application of a violent stimulus. This law is observable through all nature, and political bodies give confirmation, daily, to this assertion. Whole nations have been rendered Epileptic, to use a new expression, by hearing the exploits and victories of their armies. There is a degree of excitement which Dr. Brown places at 60, on his scale, within the boundaries of regular action; but if it extends further, the weakest and most excitable parts are thrown into irregular or convulsed action.

The same takes place with regard to diminished excitement: a certain quantity of stimuli and excitability, are necessary to support the proper action of every part of the animal economy. If the excitement, in any particular part, is below 20 in Dr. Brown's scale, this part suffers; if this happens to be the nervous system, what are generally called convulsions,

and syncope, will ensue ; if in the arterial, fevers of too little action ; and, if in the stomach, dyspepsia. Hence I conclude, that the application or abstraction of stimuli, beyond a certain degree, is incompatible with regular action, and that this irregularity occurs in the weakest part. I have used Dr. Brown's scale to elucidate my ideas upon this subject, without wishing to imply my belief that the graduation is critically just. If the debility, or tone, exists nearly equally over the whole system, they may be carried to a very great degree without being productive of disease.

But there are exciting causes of this disease that consist in an abstraction of stimuli ; these are, a great loss of blood—the abstraction of the stimulating passions—hunger—the cessation of pain, and many others mentioned by medical writers. When these occur, there is an abstraction of a great support to the system. A feeble old man, who has been used to walk with a cane, might as readily hope to support himself in a firm and regular step, after this assistance is taken from him, as a physician to suppose that regular action could be continued in great debility. After evacuating the water from the abdomen, in the ascites, syncope follows, unless bandages are applied : the abstraction of so great a stimulus destroys that tone which is necessary to regular action.

The influence of joy, heat, and the excess of blood, have already been mentioned as inducing this effect. That law of the system, that brings these two extremes to the same point, has been noticed. So great an impression had this fact upon Dr. Brown, that his theory falsely proposed the cure of both of them, even when acute, by the application of stimuli. It may not be improper to evidence a few cases, in which the same effects obtain through opposite causes. Perhaps this will prevent the startling that might ensue, upon hearing that a fit of Epilepsy may be brought on by opposite means.

A review of a few diseases, will shew that a similarity exists among them that is seldom observed—it will make us give those directions that will prevent the repetition of them—it will give us more clear ideas concerning their nature and cure. A noted medical author, much subject to the gout, has affirmed, that he could produce a paroxysm by taking a moderately drastic purge; and, who is there that knows not, that it may be produced by a fit of intoxication? How often do we see gangrene from excessive action, and how frequently does it arise from deficiency. Apoplexy has been occasioned by depletion, as well as by intemperance. The arterial system will frequently shew as few signs of action from the violent impression of a stimulant contagion, as from

considerable depletion by a lancet. Mania and delirium, without any collateral proof, afford no certainty of their origin from excess or deficiency of action; and Whyte has observed a slow pulse to arise, sometimes from a cause directly opposite to that which generally induces it. These facts are sufficient for my purpose.

Many of the exciting causes mentioned, act primarily and principally upon the nervous system; but others on the arterial. The operation of the first would naturally suggest the idea, that whatever disease arose, would, in consequence, be of the nervous kind; but the latter not so. Such would be the case if there was not a predisposition in the nervous to be affected. When the susceptibility to impression exists in a great degree, disease may be induced even when the stimulus acts through the medium of another system. In savage and rustic life, where employment gives a firmness and vigour to the constitution, the passions, excited to a high degree, produce fever; but in refined civilized society, their effects are often upon the vehicles of pleasure and pain. If it is the business of the nerves to convey impressions to the brain, and obey, the mandates of the passions, through the instrumentality of the will, whatever affects the mind, must communicate a similar influence to them. There is no novelty in the idea that there are stimuli that act principally upon the

nervous system; the same will be observed to take place with regard to every other system or part of the body. They are each of them induced with a disposition to be acted upon by impressions of a peculiar kind. But the animal economy is so constituted, that there is a general susceptibility to certain stimuli: besides, the different parts are called into action, by sympathy, by the violent impression of a body on any particular part. Thus columbo acts upon the stomach and bowels—bark upon these and the arterial system—balsam copaiba upon the urinary vessels—mercury upon the glandular and lymphatic systems—oil of amber upon muscular fibres—and opium upon the whole animal machine.

But to shew more clearly that the appearance of a disease depends much upon the peculiar exciting cause, we need but survey diseases in general, and their particular situation. Contagion most commonly affects the arterial system, and the skin; but the peculiar one of human effluvia has influence upon the nerves in particular. The scrophula affects the lymphatic glands—the itch and leprosy, the skin. When heat and cold alternate, the diseases produced, are those of the arterial system. So that not only medicines have their chief effect upon particular parts of the body, but likewise the causes of disease act specifically upon particular parts. It is true, that violent

diseases affect every part of the body; but it is equally true, that their principal force is upon particular parts or systems. Who has not seen convulsions attend inflammatory fevers, and increased action in the blood vessels in nervous complaints? Hence I would infer, not only that debility in the nervous system predisposes to affections of it; but, from analogy and facts, that particular causes exert their chief influence upon it; and, that it may be affected by a violent impression upon the arterial, or some other system.

In what manner the mind acts upon the body, or the body upon the mind, is unknown to me; but the advocates for the materiality or immateriality of the soul, all confess that their connection is great. Epilepsy, affecting the faculties of the mind, frequently arises from impressions made upon the body; and it, in turn, is often affected with convulsions by a mere association of ideas.

PROXIMATE CAUSE.

THIS consists in an irregular mixed action of the nervous system. The term *irregular* is used, to distinguish it from the action that exists in health; and *mixed*, to distinguish it from the excess that takes place in tonic gout, and tonic madness, and the deficiency that attends hypochondriasis. Haller suspects

that a kind of apoplexy is produced by the increase of action in the vessels of the brain, and adduces, as a proof of it, the redness of the face, increased heat, and *delirium animi* that accompanies this state. That the energy of the brain is affected, is evident from the phenomena of the disease; and that in some it is too great, and in others too small, is plain, from the phlogistic and antiphlogistic plan of cure being in different cases attended with success. It holds the same rank in nervous diseases, that Dr. Cullen's synochus and Dr. Rush's typhoid state of fever does in the in the arterial. As the scarlet, puerperal, and hectic fevers have been considered, by many authors, as inflammatory, and by others of equal eminence, as possessing too little action; so Epilepsy has, in like manner, undergone this variety of opinion. Since we have but little acquaintance with the nervous system, and few marks to distinguish particular grades of action in it, indications of cure, from a knowledge of the proximate cause, will be attended with difficulty. A reference must be had to the primary cause, and the particular ones that renew the paroxysms. I know of no other criterion, to judge of excessive action in the nervous system, than the pulse. In Dr. Rush's practice, I have seen tremors, hiccough, fainting, and convulsions, attended with a tense pulse, cured by the proper and liberal use of the lancet.

DISSECTIONS.

UPON the cranium being opened, phenomena present that will direct us to the true cause of the disease. It requires much attention to discriminate between causes and effects ; and we are much assisted, in this part of the enquiry, by a review of the circumstances that preceded death. Water—pus—bony excrescences—depressions of the cranium—fragments or points of bones have all been observed ; but, in some cases, the brain appears perfectly sound.* A strict examination might perhaps have discovered preternatural softness or hardness in some part ; but, if the nicest scrutiny should find neither of these to exist, it will not appear strange to my mind : for, being a disease of the whole nervous system, we have no right to expect morbid appearances in the brain in every case—they do not always exist in mania ; nor do the lungs shew marks of injury or ulceration in every case of phthisis pulmonalis.

EFFECTS OF THE DISEASE.

EPILEPSY being a violent disease, its effects, it may be presumed, are often terrible. Palsy and apoplexy sometimes succeed it ; and death itself is not unfrequently its termination. Distortions and defor-

* Willis' Pathology of the Brain.

mities take place from the same cause that debility, in the lungs, succeeds pneumonia, and, in the joints, rheumatism. But however disagreeable to the eye of the afflicted, and the beholder, the want of symmetry may appear, it is a mere nothing to what the mind suffers. The sublime and discriminating judgment, and wonderful memory, are both prostrated. All those faculties that exalt man to the first grade in creation, are frequently annihilated, and happily with them a sense of his situation.

Although the mind has much influence upon the body, still a state of idiotism is not incompatible with perfect or occasional health. If it should be asked why the body assumes an aspect of health, and has all its functions performed with regularity, after a paroxysm, and not the mind? I would answer, that the structure of the brain may be so much destroyed as to prevent the operation of the faculties of the mind, without receiving that degree of lesion that hinders the due performance of action in the body. There appears to be an exact and equal state of tension, necessary in every part of the brain for the proper exercise of the faculties of the mind, which is not requisite for the regular action of the functions of the body.

REPETITION OF FITS.

UPON what does the repetition of fits depend ? Some have ascribed it to habit ; but this, in my mind, amounts to nothing more than a new term to express an ignorance of the cause : others to a recurrence of debility. But I would object to both of them, for the following reasons—With regard to *habit*,

1st, Because the paroxysms come on generally at very irregular periods, or when at regular ones, they may be traced to some evident exciting cause, as the influence of the moon, &c. in the same manner as the irregular attacks.

2d, Because the patient can produce a paroxysm, almost at any time, by imprudent exposure of the sun, fatigue, intoxication and other means.

It is true, with respect to debility, that whatever increases it, when inflammatory action does not exist, increases the predisposition to the disease ; and, if carried sufficiently far, the disease itself : but I have already mentioned that an aptitude may exist, without the disease being ever produced. How often has the contagion of a violent fever remained dormant in the system for days, when no occasional cause has been applied to bring it into action ; and, in many instances, it has passed out without injuring it. If it should

be urged in favour of habit having produced a repetition of fits, that the interval between them constantly decreases ; I would reply, that the paroxysms merely induce an increased susceptibility, in the same manner that an attack of pneumonia, by debilitating the lungs, induces a disposition to be renewed. And who has ever ascribed a recurrence of it to habit ? Nor does the idea suggested operate in favour of debility ; for it is but one link in the chain of causes that produce this disease. The inhabitants of all northern and southern regions are exposed to all the debilitating causes that induce a predisposition to pleurisy ; but they are very seldom subject to it ; because they are not exposed to that most common of all occasional causes, the frequent and rapid succession of heat to cold. Hence I would ascribe the repetition of fits entirely to an application of some exciting cause.

PRECURSORS.

THE Epilepsy frequently comes on suddenly, without the least previous warning ; but it sometimes has its harbingers. These most frequently precede attacks that come on at regular and stated periods, and appear to be the first impressions of causes that act more durably than violent. In this particular, it is upon the same footing with the apoplexy and the gout ; and most diseases, of the violent kind, are ushered in by marks which afford an oppor-

tunity of frequently preventing any injury from being received. I have observed the following precursors ; a change of disposition and conduct—the most uncommon and inconsistent ideas—supercilious looks—haughty carriage—disdainful and obscure expressions, and unaccountable malice to particular persons and their friends—stubbornness and self-government. I am acquainted with a boy, who is easily managed in general, and displays a great pliability of temper and willingness to stay in the house, previous to a paroxysm, always become refractory and run away. And I am ~~was~~ acquainted with an elderly gentleman, whose servant could predict an approaching attack by his haughty conduct and impatience of contradiction. But in many, evident symptoms of plethora and determination to the brain take place, such as costiveness, little sleep, quickness of perception, headache, a dilated pupil, red eyes, and a flushed countenance.

Some persons can foretel an attack, by an unusual taste being perceived ; this will often occur several days, without any concomitant symptoms. I have mentioned the *aura epileptica* as accompanying the operation of one of the occasional causes of this disease ; but, upon reflection, imagine that this may be considered as one of the harbingers of it. For it is of such a nature, that a meditated attack may be prevented by timely application. Besides these, there

are others that are peculiar to different patients. A strict enquiry should always be made; for a previous knowledge may direct such methods to be pursued, as will tend to the most salutary purpose. An advantage has been taken of these precursors; and, if it should appear that a recurrence of fits depends partly upon habit, much will be gained; but, if this opinion is groundless, it will be advantageous to prevent them, because the system suffers considerably from every paroxysm. In pleurisy, where we do not suppose a repetition of attacks to depend upon habit, we bleed and use the antiphlogistic regimen in its various parts, to prevent that debility from taking place in the lungs, that paves the way for consumption, and renders every slight disorder of the system liable to be accompanied by an affection of this organ.

PREVENTION OF A PAROXYSM.

It has already been observed, that a predisposition may exist through life, without the disease taking place, and, that an occasional cause may often be applied, without injury, if there is no predisposition. But, when an epileptic diathesis exists, much care must be taken to produce a firmness of constitution, and prevent the application of an exciting cause; for the preventing of a paroxysm not only relieves the feelings of the patient, but gives the nervous system time to regain that degree of stability, that permits actions

only in proportion to the violence of the impression. These circumstances afford strong inducements to observe the preceding harbingers, and to take advantage of their first appearance.

A review of them, will shew that they are generally symptoms of increased action in the vessels of the brain, and sometimes of plethora in the whole system. Hence bleeding, and the antiphlogistic plan, will be found to be the most rational and successful means of prevention. These will only effect a reduction of that excitement in the arterial system, which would otherwise stimulate to excess; and this theory and practice are powerfully supported, by the means we use to obviate an approaching attack of its sister-disease, the apoplexy. If there is a periodical fulness of the vessels of the brain, or the whole system, nothing can be so efficacious, in practice, as the use of the lancet. Cullen has mentioned the beneficial effects of this remedy, and Bonetus and others recite some cases, in which a perfect cure was effected by it. The pulse should be one of our principal guides, in directing us to its use.

Purgatives should be joined with it; for they reduce excitement, and create a determination to the bowels, and may be used when phlebotomy is not necessary. There is often that degree of action, pre-

vicious to a fit, that this remedy and emetics are just suited to destroy.

Van Swieten mentions an instance of a school-master, who could prevent an attack by keeping his stomach moderately full.

Opium has proved of essential service, if administered when the system was labouring under direct debility. It prevents a susceptibility from existing or arising to a great degree. When given at bed-time, it has frequently obviated an attack; for it hinders that degree of debility from occurring, that lays the foundation of a paroxysm. Those cases that are preceded by the *aura epileptica*, seem particularly adapted to this remedy; for they shew a great degree of mobility in the nervous system. Dr. De Haen has given a case in which the fits were prevented by avoiding sleep, and which finally yield to opium.

Should an association of ideas prove an exciting cause, we must prevent a paroxysm, by producing some violent impression upon the mind, such as fear; in this manner, the celebrated Boerhaave prevented it in the Poor-house at Hærlam. Should violent emotions occasion it, we must be careful not to visit those places, in which there is a probability of having them excited. Should the influence of the moon produce a paroxysm

we should be careful to mark the precursors, and act accordingly; but should it be excited by that cause which is attended by the *aura epileptica*, we should examine the part from which the sensation arises. If an irritating substance is observed, it should be taken out, and then the disease has been known to disappear; but, if the part has the resemblance of being perfectly sound, we should nevertheless, make a considerable incision into it, or in the course of the *aura*. Blisters and issues upon the part have often had the same effect, and even binding with a string, the limb, above where the sensation originates, has prevented a paroxysm. A destruction of the part, from which the *aura* arises, is the primary object, the manner of effecting it, whether by knife, caustic, issue, &c. has but little influence in the cure. Should fever, and the irritation of the eruption of the small-pox or the measles, be the exciting cause, bleeding, cool air, &c. will prevent the repetition of paroxysms. Should dentition be an exciting cause, cutting the gum upon the appearance of the tooth, will ensure returning health. Should acidity in the stomach, or an irritation in the bowels, be the exciting cause, their effects may be prevented by absorbents, cathartics, and other remedies. Should heat, violent exertion, or fatigue occasion a paroxysm, the exercise of reason will prevent a return from those sources. If irritations, from any cause, be found to excite it, a preven-

tion of the disease consists merely in obviating and avoiding them. Crowded assemblies, and places, where there is a want of free circulation of the air, should not be frequented. From the previous enumeration of the occasional causes, it is evident, they are many, and require each of them attention. Different persons are more easily affected by some peculiar ones, and it should be the business of the physician, to make himself acquainted with the influence of each, in order to prevent their effects.

TREATMENT DURING A PAROXYSM.

This is a period of the disease that is attended with the greatest hazard, but one in which our exertions, most commonly, are the least. Instead of danger and misery exciting our attention in proportion to their degree, we remain idle spectators, and leave the patient to his fate. Why this should be the case, in this disease, and not in others, is unaccountable; and those gentlemen who look forward, with great reason, to the perfection of medicine, will discard an idea so unworthy of their profession, and so humiliating to the pride of human resources.

A review of the situation and circumstances attending a fit, together with the causes and phenomena of it, will point to something useful. Since persons are

liable to be attacked in crowded assemblies, a primary object will be, to remove them to a place that is properly ventilated—all unnecessary attendants should be dismissed. This has often been directed, but seldom any thing else has been attempted, and when it has, it has been entirely empirical, and has shewn no regard, to the variety that is necessary when there are many cases.

The exciting causes, the harbingers of the disease, together with the symptoms, discover that there is commonly too much action in the arterial system. Hence bleeding will sometimes be necessary to palliate a paroxysm, and to reduce that action that would produce effusions, so often the effect of this disease. From the continuance of the disorder, the brain labours under chronic debility, and of course, is easily rendered apoplectical, by a small increase of action. Dissections shew that this is the most common attendant upon a fit that terminates in death. The quantity of blood taken should be in proportion to the violence of the affection. Besides, this treatment permits stimulants to be used afterwards with less danger and more efficacy.

When the pulse is feeble, laudanum, when it can be given, may be administered with advantage.

The diffusibility of this stimulus renders it extremely serviceable in many instances. It may be repeated according as occasion demands,

But it sometimes terminates in coma, and then those remedies, should be applied, that are in common use when this state succeeds apoplexy. But as this last disease is more frequently attended with plethora, we will have less hesitation in using stimulants in Epilepsy than in it. Blisters, acrid cataplasms, the potential, and even the actual cautery, should be tried.

TREATMENT DURING THE INTERVALS OF PAROXYSMS.

The suddenness of the attack, and the violent convulsions attending it, throw a veil of superstition over the minds of the first practitioners of medicine. It was viewed with reverential awe, and none dared attempt the cure of a disease that was supposed to be inflicted by the hand of heaven. Accident and time, however, effected some cures, that brought dawning and assenting reason to try similar methods. These have formed the only clue to the improvement of medicine in savage life; and, even in our present state of science and medicine, we take advantage of these in perfecting the healing art. And however much the reasoning faculties of man deserve to be boasted

of, still they are found insufficient of themselves, to discover the nature and cure of every disorder.

Let us examine what accident or time has effected, and obtain whatever light, upon the nature and cure of this disease, these sources will afford. Puberty, travelling, and the vigour inspired by rustic and military life, have each cured it; hence we would infer, that tonics, in some cases, may prove serviceable.

Van Swieten* remarks, that Hippocrates observed, that those who are seized with a quartan, do not suffer the Epilepsy; and that a quartan, coming after that disease, cured it. He quotes a case in which the paroxysm returned every week, and was cured by a quartan fever; and another, in which it returned several times a-day, that was cured by an epidemic fever. And all writers upon epidemics observe, that a violent attack of them carries off complaints of a very long standing. From these last facts, we would conclude, that concentrating the excitement in the arterial system may, in some cases, be of advantage. But if we may judge from analogy, considerable morbid excitement raised in any part of the animal machine, except in the nervous system, will be of equal service. Willis relates the

* Vol. X. p. 369.

case of a girl who was subject to Epilepsy—she, in one of her fits, fell into the fire and burned her face and head exceedingly ; but, as long as the ulcers remained open, she was free from the disease. Hollereus furnishes us with a similar instance. Dr. Meade relates a case of Epilepsy that occurred at the same period with the tides, and was cured by an ulcer on the head, the consequence of a blister. These last examples will serve to shew, that morbid excitement accumulated in any part of the animal economy, but the nervous system, serves to relieve it—Some advantage was certainly derived, from discharging any great excess of excitement that might have occurred. The part affected bears the force of all impressions, and suffers the nervous system to regain its tone. Dr. Hodges, in his treatise upon the plague, gives a remarkable example of this. During the rage of that violent disease in London, he had a seton in his leg, and attributes his escape from its deadly ravages to this cause. Whenever his system became surcharged with contagion, the seton inflamed and discharged more considerably. This not only serves to shew the inflammatory nature of the plague ; but likewise the means and necessity of keeping the system at those grades of excitement at which regular action or health must necessarily attend. Diarrhœa is often cured by blisters ; and Hippocrates has pronounced ulcers in the legs, to be very useful, even in vehement disorders

of the lungs. These facts are sufficient to establish the position; and my friend Dr. A. Alexander, in his inaugural dissertation on the influence of one disease in the cure of another, has happily taken advantage of this law of the animal economy, and taught when and how to apply it.

It is true, that whatever is administered must have some operation upon the nervous system; but as the doctrine of particular medicines exerting their chief influence on peculiar parts is firmly established, we may use those medicines that are powerful, without throwing the nervous system into irregular action. Thus, through the peculiar organization of the glandular system, mercury and its combinations act principally upon it. Dr. Darwin has happily called, the susceptibility of particular parts to be acted upon by peculiar stimuli, by the name of animal selection or appetency—it depends upon their original conformation, and not upon an intelligent principle in them. From these facts and accidental cures, a mode may be instituted that will prove beneficial; but in every instance, it must be varied and directed by the state of the system.

In the end, the cases noted amount to nearly the same thing; for the cure in all depended upon giving tone to the nervous system, and all the discord upon

the subject may be reconciled. Thus, tonics gave firmness to the whole body, and made slight impressions produce corresponding actions—the fevers threw all the morbid excitement into the arteries, and gave time to the nerves to recover their lost tone—the ulcers acted nearly in the same way, but prevented, by a discharge, too great a degree of action. It is observable, that their violence and continuance must be considerable to absorb all the morbid excitement, and give time to the nerves to become firm. All the usual stimuli will act considerably upon the nerves, unless a part is much affected by an acute disease, and then its excitability is so accumulated as to throw itself in the way of every stimulus.

Should inflammatory action exist, it should be reduced ; for this alone, has cured convulsions, by giving strength to the oppressed nervous system. The practice, that contemplates giving tone by the abstraction of stimuli, appears absurd at the first sight ; but reflection approves of it, and facts confirm its propriety. The arterial system has shewn too many evidences of it to leave a doubt. It has been prostrated by the excess and stimulus of the blood ; so has the nervous occasionally, by the excess of action in the arteries. This law appears far from being partial or limited in its extent. The action of cold, in a sultry day, by abstracting the superabundant stimulus of heat and

giving tone, is a familiar instance of it. The impression being made upon the arteries, they would suffer the most materially, were not the nerves possessed, in those instances, of great mobility or disposition to be thrown into action.

By attending to that great principle in medicine, to be guided “by the present state of the system,” we shall be able to effect much in the cure of this disease. Had this principle been known, or properly attended to, it would have prevented bleeding, and bark and wine, in their turns, from proving destructive in intermittent, hectic, puerperal, and scarlatina fevers. All that obloquy, that medical writers, even of eminent characters, have used so liberally, would have been dispensed with.

I have placed Epilepsy in the same grade in nervous diseases that these states of fevers, just mentioned, stand in the arterial; like them, it has been the subject of litigation and different practice. Reason would approve of the latter, but change is not the characteristic of empiricism.

An affection of the nervous system is not sufficient evidence, of itself, to induce the idea that the system at large labours under direct debility. Fainting and convulsions attend the yellow fever, and one of the

most violent inflammatory fevers I ever saw, was attended with tremors and syncope. And, it is clear to me, that three cases in four of nervous fevers, arise from not reducing inflammatory action in the blood-vessels, and permitting it to wear itself down.

When paroxysms arise from plethora, depletion does not weaken the nervous system, but gives it time to recover a proper degree of insensibility. Bleeding and purging should be used, as long as there is an excess of action in the arterial system ; and even when there is none, they should be employed in the first stage in a small degree, to render the application of tonics more powerful. This was Sydenham's happy method. They increase the excitability of the system, without reducing it to that degree of debility that portends danger. And when a course of tonics is prescribed, the state of the system should always be attended to in each visit ; for it seldom happens that it remains long in the same situation. The use of these remedies must occasionally be laid aside, until the inflammatory action, which accident and a change of temperature in this climate will often produce, has been destroyed. There appears to be an absolute necessity for this precaution ; because nothing but keeping it at certain grades of excitement will effect a cure.

It is not easy, and perhaps may be dangerous, to imitate nature in producing fevers for the cure of this disease; but we may derive some consolation during their existence, if they should occur, from the reflection, that they have been beneficial in this, and all others of the nervous system, as, mania, apoplexy, &c.

RELIEVING BY EXCITING MORBID ACTION IN ANOTHER PART.

IF there ever was such a thing as a panacea, it must certainly be mercury. Dr. Rush has emphatically called it the Sampson of the materia medica. It has not only triumphed over syphilis,* dysentery,† scarlatina,‡ yellow fever,§ and hepatitis,|| been beneficial in the last and most dangerous stages of pneumonia, typhus mitior, small-pox, tetanus, hydrocephalus and cynanche trachealis, but has lately received trophies from its subduing many cases of nervous affections. The hypochondriac, the paralytic, and the epileptic, have each with pleasure confessed its power.

The proper application requires much skill and attention, and it should never be exhibited while

* Hunter, and all writers upon the subject. † Clark on hot climates. ‡ Ogden. § Dr. Rush. § All late East India writers.

there is much inflammatory action in the system. If it be considerable, in vain will a ptialism be expected; and, even if it should take place, if inflammatory action is produced in the arterial, superior to that which the mercury induces in the glandular system, it will be stopped. This observation applies not only to Epilepsy, but likewise to all other diseases. A paroxysm of a moderately inflammatory fever will stop a ptialism; and the action of the yellow fever and hydrocephalus internus is such, that unless depleting remedies have been previously used, a spitting cannot be effected until an effusion, which it was intended to prevent, is induced.

Since mercury acts principally upon the glandular and lymphatic systems, it will not excite wonder, that its operation does not occasion a violent impression upon the nerves. This, as likewise some remedies to be mentioned hereafter, must be continued for a considerable time, and in a violent degree. Unless the inflammation and tumefaction of the glands of the fauces and the gums are such as to prevent speaking at all; or, at least, distinctly for several weeks, little benefit can be expected. A new action is produced, that renders the glandular system so excitable, that it absorbs the effect of every stimulus, that might otherwise generate morbid excitement in another part of the animal economy. Besides, the discharge prevents

any stimulus from raising the excitement to too great a degree. A salivation renders the arterial system so irritable, that, after it has gone off, it, and not the nervous, receives whatever impressions are afterwards made. Zimmerman* quotes Kaau Boerhaave, in confirmation of the efficacy of a salivation in the cure of this disease. Dr. Rush, in his lectures, has likewise mentioned several happy terminations of it, by means of mercury; and Dr. H. Smith, it is said, has used this medicine with the same beneficial effects. Theory would lead to the use of it, and practice has confirmed the propriety of exhibiting it.

Issues, setons, and caustics, may be considered somewhat in the same light; their operation, however, is much more feeble. They are frequently united to tonic remedies, and, to be useful, must produce inflammation to a considerable degree and duration. The cases, already quoted from Mead, Willis, Hollereus, and many others to be found in medical writers, of cures by accidental wounds, gave these remedies a repute that time has not lessened. Dr. *Perfect* has effected several cures by combining with a seton, some tonic medicine. These last are not entitled to all the credit, since setons, issues and caustics have individually been of the same service.

* Experience, Vol. II. p. 373.

There are cases, mentioned by authors, in which the delicacy and mobility of the nervous system was such, that the least increased action in the arterial, or a small impression upon the mind, threw the nerves into convulsions. In these instances, it would be most proper not to excite morbid action in another part, but to give tonics, particularly those that acted chiefly upon the nervous system.

In preventing the recurrence of the disease, much depends upon obviating the predisposing cause—this we fixed in debility. Accidental cures confirm the truth of this idea, and gave the first suggestion of the propriety of administering tonics. These seem to be divided into two kinds; those that act principally upon the nervous system, and those that operate upon the whole animal machine; of the first kind are fetid gums, musk, agreeable sensations, garlic, &c.; of the latter, the preparations of iron, cold bath, food, exercise, and other remedies.

Whenever the violent use of a medicine has produced the Epilepsy, it has always been religiously withheld in a plan of cure; but this conduct, reason and facts will discard, provided the medicine has only, by its excess, acted as a remote cause. Cold is a principal remote cause of the inflammatory state of fever, and yet few remedies are of more service

in its cure. A gleet is the product of a violent inflammation in the urethra, and yet, a fresh gonorrhœa has cured it. Wine and rich food with indolence, act as remote causes to the gout; and yet, in many instances, they are of essential service in preventing a paroxysm. When a remote cause produces a predisposition, by its stimulus, it may be applied to advantage, in small quantities, during the predisposition, in preventing a disease from occurring.

Many censures have been passed upon stramonium and other medicines, whose operation Dr. Cullen conceives to be sedative; but I imagine that these lay, the foundation of debility, in the excess of stimulus. A small dose would give gentle tone, while a larger one produces debility. Thus a gleet generally derives its origin from the irritation of venereal matter, or some stimulating substance, and yet we apply gentle stimulants and astringents in curing it. Exercise in a violent degree induces a predisposition to disease; but when it is gentle and acts upon debility, it restores health.

As slight affections of the nervous system have been removed by garlic, castor, and assafoetida, I presume they may be mentioned with propriety in this place. Nothing more being necessary, in the administration of them, than proportioning the dose to the violence of the disorder. They give a gentle stimulus.

Many others might be mentioned, whose effect is similar ; but it will be unnecessary to be particular on this point, since their tendency is to give tone.

Prefuming that nothing now remains but predisposing debility, I will notice some remedies that are intended to correct it ; but as it is sometimes derived from original stamina, and at others brought on by a combination of causes that have acted long on the system, it will be necessary, in order to obviate it, to use them for a considerable portion of time.

The vegetable tonics consist in

BARK.—This, it has been observed, has been combined with a seton to advantage ; and, from a knowledge of its mode of operating, much has been expected from it. Dr. Cullen and others have found it serviceable ; but this, like all other powerful medicines, has often failed, and even proved detrimental, by not being administered in a proper state of the system. It is rendered more palatable, by being joined with an aromatic.

OPIUM.—In this situation, it has been of singular service, when given in small and repeated doses. By its general impression upon the system, and the stimu-

lating quality residing in it, one part is prevented from being thrown into exclusive action.

VALERIAN.—Much has been said with regard to the efficacy of this remedy, and some cases are related by authors in which it performed radical cures.

OIL OF AMBER.—This has been found useful, as a tonic, in Epilepsy. It is one of those medicines that has been administered with success in tetanus, and serves to shew the relationship between nervous diseases. This view will destroy empiricism, and discover sources from which we may derive much advantage.

MINERAL TONICS.

The preparations of Iron—These are similar to the bark in effect; but the simple rust or oxyd is attended with this additional advantage, that it keeps the body gently open, and, of course, keeps up a more regular excitement. Chalybeate waters, under the direction of a skilful physician, have been of service. In frequenting them, we often combine travelling, amusements, and society, with the efficacy of the water; and from these being of utility in other nervous affections, we may indulge the hope that more

advantage, in the cure of Epilepsy, may be derived from them, than is yet known.

But the preparations of *Copper*, are of ancient use, in the cure of this disease. Aretæus, long since, mentioned their virtues, and succeeding physicians have subscribed to his opinion. The cuprum ammoniacum is the preparation most commonly exhibited.

Dr. Sims used a solution of lunar callic with success : towards the latter part of the time, he combined bark with it. His paper is inserted in the 4th volume of the Memoirs of the Medical Society of London.

The *Flowers of Zinc*, have been highly recommended by the German physicians, in curing this and other disorders of the nervous system, but have not been estimated, to that great degree, by the British. When combined with assafoetida I think I have observed them to be of use.

In addition to these, *white vitriol* has been recommended by many authors ; and Dr. Kuhn observes, it has been of service in his practice.

ARSENIC has likewise been mentioned.

Perhaps there are few remedies that act more powerfully, in giving tone to the system, than the cold-bath. Universal experience confirms the utility of it, in diseases of too little action. To produce invigorating effects, it should be employed for a short time only, and in that state of the system in which the reduction of excitement will be attended with no ill consequences; or, to use Dr. Cullen's expression, when the system can re-act. The sedative operation of cold is such, that a long continuance of the bath, at one time, would, in some instances, entirely destroy the excitement. This tonic is particularly adapted to our climate in summer; for the heat is sometimes so intense as to preclude gentle exercise. For the preceding reason the cold of winter should be carefully avoided.

All the diseases of the nervous system run into each other, or rather they are different grades of the same disease. From this circumstance, I would employ in the cure of Epilepsy, when there is nothing but mere debility to be overcome, all those remedies, that have been beneficial in dyspepsia, hypochondriasis, tetanus, &c. A view will be had principally to those which operate upon the system at large. Mercury has been found of advantage in these disorders—so it has in Epilepsy. The cold-bath has been found

useful in these disorders—so it has in Epilepsy. A regard must be had in adapting, in all cases, the remedy to the degree of affection in the nervous system.

Dr. Cullen, in speaking of apoplexy, says, “ Although the whole of the body is affected with the loss of sense and motion, it sometimes takes place more upon one side of the body than the other ; and, in that case, the side least affected with palsy, is sometimes affected with convulsions.” This would lead us to suspect an affinity between palsy and epilepsy ; but, the latter state of the system terminating in the former, removes every shadow of doubt. Electricity has certainly been found serviceable in this disease ; and, if we have proved a relationship between them, there is every reason to hope benefit from its use in Epilepsy ; but much circumspection will be necessary in the administration of it. Experience has taught that the shocks should be light and frequent, in most instances, to be of advantage ; but in this they should more particularly be so ; for a violent one would be as injurious as a violent emotion of joy, or any other sudden and considerable impression.

Ingenuity has been exhausted in discovering remedies for this disorder ; and even the trepan itself has been resorted to—but the cases, in which it could be

presumed useful, are but few. Mr. Bell* assures us, that it has been productive of death in two instances, out of three, in which it was applied. Those, in which it could appear necessary, arise from injuries of the cranium, and afford a presumption of a depression or an effusion.

Medical authors have furnished us with many facts, in proof of the operation of the passions being curative as well as productive of this disease. Since they are but little under our controul, and as it is impossible to excite them to the exact degree we require, it would be imprudent to rouse them.—These cases, however, have their use, as they teach us what ought to be done. If prudence would withhold a remedy whose force it is impossible to foresee, still we are left to the application of those whose effects are nearly equivalent. If we do not chuse to excite a violent paroxysm of joy, we may create the durable and pleasing emotions of hope. The influence of fright has also been favourable; but perhaps this should have been mentioned with bleeding and purging.

DIET—has much influence upon all chronic affections; and directions concerning it, should be given

* Vol. III. p. 185.

with as much care, and followed with as much attention, as those relative to medicine. Many diseases, both of the acute and chronic kind, derive their origin from irregularities in living; abstinence, of course, would seem, and really is, productive of advantage. Dr. Hunter has related a case of dyspepsia that was cured by a continued milk diet. A question will naturally arise, relative to the kind and quality of food that are most proper to be taken; this experience and reflection will answer. If nervous affections, and of course Epilepsy are most frequent in civilized and polished life, we must trace the principal differences between it and uncultivated, and derive, from these differences, some aid in curing these diseases. Perhaps in contrasting them, diet and indolence are the most prominent features. If the food of the savage and the cultivator of the soil be simple and have but little variety, and they are principally freed from nervous affections, that of the epileptic should likewise be so. Whatever has a tendency to prevent the formation of these disorders, has likewise an influence in preventing the repetition of them, when only a predisposition exists. Intemperance in eating and drinking, attended with indolence, produces the gout, and we place our greatest hopes of a radical cure in moderate and frequent exercise, joined to a regularity in living. That diet has all the influence we have ascribed to it, is evident, since we can sometimes tell the mode of

living, from the disease under which the patient labours. The food should be simple, and not rich—in this manner, we seldom eat too much. It should be taken several times a day to keep up a regular excitement. Spices, should by all means be disused, because they stimulate without affording nourishment.

The drinks should consist chiefly of simple water ; but, in a few instances, the best wine may be combined with it—ardent spirits should especially be avoided ; for they produce, when taken in a considerable quantity, a temporary paralysis of the faculties of the mind ; and, in a continued use, a total destruction of them. The whole train of nervous diseases, from the simple tremor to the most violent apoplexy, are their offspring ; and I know of no one direction more necessary to be given than their disuse. Dr. Rush* has mentioned the group of terrible disorders that arise from them ; and if they are so destructive in originating diseases, how much more powerful must they be, when acting upon predisposition ?

EXERCISE.—This should be in kind and degree in proportion to the strength of the patient ; and fatigue should never be induced. I have known paroxysms excited by excess of exercise, which, had

* Medical Enquiries, Vol. I.

it been gentle, would have been prevented. This and diet should require particular directions, in a plan of cure in this, as well as in all chronic diseases; for much may be expected from their proper use and application—Travelling has particularly been recommended, and proved useful in some cases—it has a tendency to give vigour to the body, and that tone that will destroy predisposition.

A choice of climate will be highly requisite, and that one preferred which is agreeably mild, and not subject to great changes of temperature. From a review of the prominent ideas in this essay, such a choice would be suggested; for, we have wished to avoid, every thing that would make a sudden impression upon the system. This rule is adhered to in consumptions, and, why not in this disease?

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